

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 19. (Cancelled)

20. (Currently Amended) A method of producing a semiconductor integrated circuit device comprising the steps of:

(a) forming bit lines and a first layer wiring over a MISFET on a main plane of a semiconductor substrate through a first inter-layer insulating film, forming a second inter-layer insulating film and an electrode-forming insulating film, and etching holes in said electrode-forming insulating film;

(b) forming a metal or a metal compound for providing on an inside of said holes, and then forming cylindrical first electrodes by forming a metal film or a metal compound film covering the inner wall of said holes;

(c) depositing a dielectric capacitance insulating film to cover said first electrodes, and depositing further a ruthenium film by a CVD method and a conductor layer by a spatteringsputtering method;

(d) patterning said ruthenium film and conductor layers to form second electrodes; and

(e) depositing a third inter-layer insulating film covering said second electrodes, and forming a first connection hole reaching said second electrode and a second connection hole reaching said first layer wiring, by etching,

wherein said conductor layer comprises a tungsten film and said third inter-layer insulating film comprises a silicon oxide film, and

wherein said conductor layer and said first layer wiring are comprised of a material having a lower etching rate than said ruthenium film under a condition where the silicon oxide film is etched.

21. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 20, wherein, after said second conductive layer is etched, said ruthenium film is etched by using said conductive layer, that is patterned, as a mask.

22. (Previously Presented) A method of producing a semiconductor integrated circuit device including the steps of:

- (a) forming first electrodes on a first insulating film formed on a main plane of a semiconductor substrate;
- (b) forming a capacitance insulating film over said first electrode;
- (c) forming second electrodes over said capacitance insulating film;
- (d) forming a second insulating film on said second electrodes;
- (e) forming an opening for exposing a part of said second electrodes into said second insulating film by using photoresist film as a mask;
- (f) ashing said photoresist film; and
- (g) forming a conductor layer inside said opening;

wherein the formation step of said second electrode includes the steps of:

- (i) forming a ruthenium film by a chemical vapor phase growing method containing oxygen over said capacitance insulating film; and

(ii) forming a metal layer not containing oxygen over said ruthenium film,

wherein said ruthenium film directly contacts to said metal layer.

23. (Cancelled)

24. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 22, wherein said metal layer comprises a tungsten film or a tungsten nitride film.

25. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 22, wherein said metal layer is formed by a sputtering method.

26. (Currently Amended) A method of producing a semiconductor integrated circuit device including the steps of:

(a) forming a plurality of mutually spaced-apart first electrodes over a first insulating film formed on a main plane of a semiconductor substrate;

(b) forming a capacitance insulating film over said first electrodes;

(c) forming continuous second electrodes with respect to a plurality of said first electrodes, over said capacitance insulating film;

(d) forming a second insulating film in order to cover said second electrodes;

(e) forming a hole for exposing a part of said second electrodes into said second insulating film by using photoresist film as a mask;

(f) ashing said photoresist film; and

(g) forming a conductor layer inside said hole;

wherein the formation step of said second electrodes includes the steps of:

(i) forming a ruthenium film over said capacitance insulating film;

and

(ii) forming a metal layer having a greater film thickness than said ruthenium film over said ruthenium film, and said metal layer has a lower resistivity than said ruthenium film,

wherein said metal layer has higher oxidation resistance than said ruthenium film, and

wherein said ruthenium film has a larger internal stress than said metal layer has.

27. (Cancelled)

28. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 26, wherein said metal layer is a tungsten film or a tungsten nitride film.

29. (Currently Amended) A method of producing a semiconductor integrated circuit device including the steps of:

(a) forming a plurality of mutually spaced-apart first electrodes over a first insulating film formed on a main plane of a semiconductor substrate;

(b) forming a capacitance insulating film over said first electrodes; and

(c) forming a continuous second electrode with respect to a plurality of said first electrodes, over said capacitance insulating film; wherein:

th formation step of said second electrode includes the steps of:

(i) forming a ruthenium film over said capacitance insulating film in such a fashion as to provide said ruthenium film within the spaces between said mutually spaced-apart first electrodes by using a CVD method; and

(ii) forming said metal layer including tungsten over said first metal layer by using a sputtering method;

wherein said metal layer has higher oxidation resistance than said ruthenium film.

30. – 31. (Cancelled)

32. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 29, wherein the film thickness of said metal layer is greater than that of said ruthenium film.

33. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 29, wherein said metal layer is a tungsten film or a tungsten nitride film.

34. (Previously Presented) A method of producing a semiconductor integrated circuit device according to claim 29, wherein said ruthenium film comprises a first ruthenium film formed by a sputtering method and a second ruthenium film formed by a chemical vapor phase growing method over said first ruthenium film.

35. (Cancelled)

36. (New) A method of producing a semiconductor integrated circuit device according to claim 20, wherein said metal or metal compound comprises a tungsten film.

37. (New) A method of producing a semiconductor integrated circuit device according to claim 26, wherein said ruthenium film comprises a first ruthenium film formed by a sputtering method and a second ruthenium film formed by a chemical vapor phase growing method over said first ruthenium film.